



**CENTER FOR RELIABILITY  
SCIENCES AND TECHNOLOGIES**

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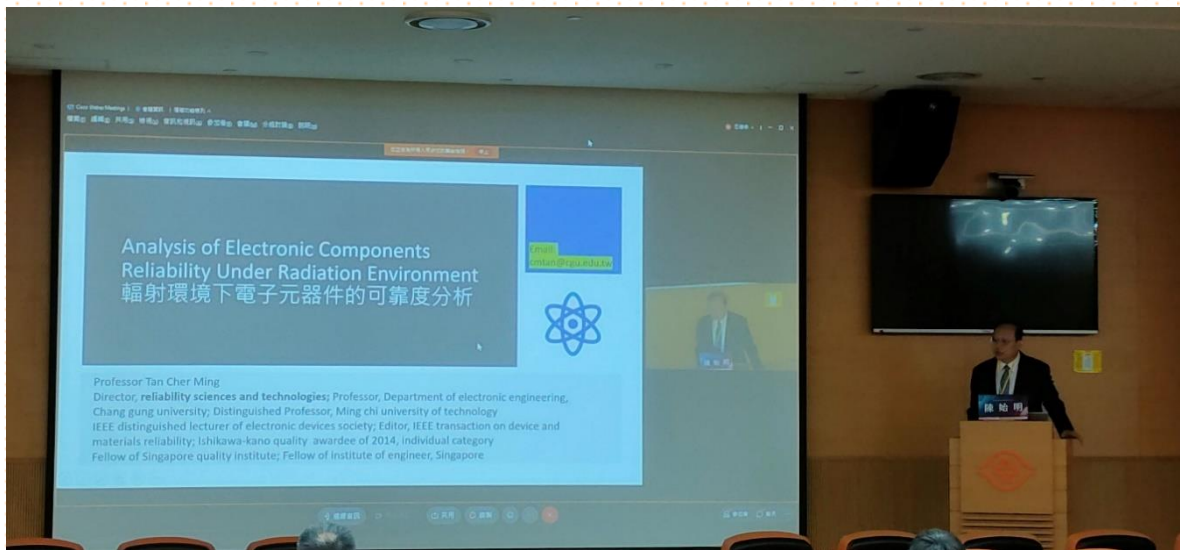
*The Newsletter*  
*August-December, 2021*

## *New Students join CReST lab -August, 2021*



On the first semester of 2021-2022 academic year, Jia Hung Lin, Ray Chen and Debraj Banerjee are admitted to the Master Program of the Department of Electronics engineering and will be supervised by Prof. Cher Ming Tan in CReST lab for their tenure. Their research areas will be reliability management system, Electroless plating and electromigration testing and analysis in integrated circuits and solder joints.

## *Prof. Tan Presents in Space Radiation Conference- October, 2021*



Prof. Tan was invited to give a talk in the “Space Radiation Environment Test Seminar”, organized by NAR labs of the National Space Organization (NSPO), Taiwan. He presented on the topic “Analysis of Electronic Components, Reliability under Radiation environment.” CReST Student members namely Abdul Shabir and Jason Yu also attended the event.

## *CReST Student Presents on IEEE Conference- October, 2021*



Abdul Shabir, who is a PhD student of the Department of Electronic Engineering working under Prof. Cher Ming Tan in CReST Lab has recently made an Oral Presentation in the International Conference of Science, Education and Viable Engineering held in Taitung Taiwan. He has presented on the topic “Effect of moisture content on the degradation of Silicone used as an LED optical housing material-An ab initio study”

*Prof Tan Presents in IEEE\_EPS symposium-  
November, 2021*



THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS  
is pleased to present this Certificate to

**Prof. Tan Cher Ming**  
*Chang Gung University*

**Invited talk: “ Degradation Mechanism of High Power LED Packaging in  
Outdoor Environment and its Acceleration Model”**

In recognition and appreciation for your presentation at the 2021 IEEE-EPS  
Symposium on Reliability of Electronics and Photonics Packaging (REPP'21)



*R. Gnyaneshwar*

Gnyan Ramakrishna, REPP General Chair  
and Chair of EPS TC on Photonics

*Richard Rao*

Richard Rao, REPP Program Chair,  
and Chair of EPS TC on Reliability

Prof. Tan was invited as a speaker in “IEEE-EPS Symposium on Reliability of Electronics and Photonics Packaging (REPP’21),” where he presented on the Topic “Degradation Mechanism of High Power LED Packaging in Outdoor Environment and its Acceleration Model.”

## *Quarterly lab meeting of CReST Lab- November, 2021*



The Quarterly Lab Meeting of CReST Lab was held where Prof. Tan and Prof. Hsiao Hsien Chen of CReST Lab presided over the meeting. The new students were formally welcomed into CReST and matters regarding Equipment handling and rules were revised in the meeting.

## *Company Personnel visits CReST Lab- November, 2021*



Officials from various Companies such as eZoom Information. Inc, Atech, Innolux, TPC, HIWIN, Hermes Epitek, etc. visited CReST lab where Prof. Tan introduced them about the Lab and its services provided for Reliability Evaluation and Failure analysis.

## *Prof. Tan Presents in Green Energy meeting- December, 2021*



Prof. Tan was invited as a speaker in the Conference titled “The impact of green energy and sustainable development in the industry (Innovative Technology Sharing Matchmaking Association)” where he presented on the topic “A method for measuring the State-of-Health and the remaining useful life of Lithium-ion batteries.” Miss Hannah Yang, Jia Hung Lin and Jason Liu of CReST Lab also attended the conference with Prof. Tan where they have participated in Poster Presentation.



*Prof. Tan was invited as a technical program committee member in Taiwan ESD and Reliability Conference (TESDC-2021) held in November.*

*Prof Tan was nominated as Council member of Taiwan ESD Association, and Council member of World Alliance for Chinese Quality.*

## *Recent Publications (August-December, 2021)*

1. Hsu, S.C.; Chiang, H.H.; Huang, T.Y.; Chao, S.H.; Wu, R.T.; Lu, C.Z.; Huang, J.H.; Chang-Jian C.W.\*; Weng H.C.\*; Chen H.C.\* Morphology evolution and electrochemical behavior of  $\text{Ni}_x\text{Mn}_{1-x}(\text{OH})_2$  mixed hydroxides as high-performance electrode for supercapacitor *Electrochimica Acta*, 2022, 403, 139692.
2. Sun, H.; Tung, C. W.; Qiu, Y.; Zhang, Wei.; Wang, Q.; Li, Z.; Tang, J.; Chen, H.C.; Wang, C.\*; Chen, H.M.\* Atomic Metal-support Interaction Enables Reconstruction-free Dual Sites Electrocatalyst. *Journal of the American Chemical Society*, Just Accepted
3. Chen, H.C.; Shabir, A.; Tan, C.M.\*; Singh, P.; Lin, J.H. Degradation dynamics of quantum dots in white LED applications. *Scientific Reports*, 2021, 11, 24153.
4. Wei-Cheng Lin<sup>1,2,3</sup>, Ming-Chiu Chang<sup>2</sup>, and Chien-Hung Liao<sup>1</sup>, "Design of 150 $\mu$ V input-referred voltage 1GHz comparison frequency dual offset cancellation comparator for pH biomarker System-On-Chip ", *International Journal of Circuit Theory and Applications*, Sept 30, 2021. <https://doi.org/10.1002/cta.3163> . (JCR SCI, IF 2.038)
5. Wei-Cheng Lin<sup>1,2,3</sup>, Ming-Chiu Chang<sup>2</sup>, Chun-Ting Hsieh<sup>2</sup>, Su-Yu Chia<sup>2</sup>, and Chien-Hung Liao<sup>1</sup>, "Design and Fabrication of High-Sensitivity Flexible Capacitance Sensor Applied In Vivo Measurement Such as for Abdominal Compartment Syndrome After Surgery", *IEEE Sensors Letters*, Vol. 5, Issue 6, May 4, 2021. (Digital Object Identifier: 10.1109/LSENS.2021.3077580) (EI)
6. Chun-Ting Hsieh, Shang-Hsien Wang, Chun-Wei Yeh and Wei-Cheng Lin\*, "Reliability Evaluation and Redesign Methodology for RFCMOS Transceiver Frontend Circuits in Sub-6GHz Band of Fifth-Generation New Radio Communication Based on the Reliability Model ", *International Journal of Circuit Theory and Applications*, 49(10), page:3443-3454, April 26, 2021. <https://doi.org/10.1002/cta.3027>. (JCR SCI, IF 2.038)
7. L.-A. Lai, L.-J. Lai, C.-Y. Li, H.-C. Chen, "Hardware-efficient evolutionary compensation circuit for fixed-width Booth multiplier," in *VLSI Design/CAD Symposium*, Taiwan, August 3-6, 2021.
8. Chun-Bing Chen, Hsuan-Ling Kao\*, Li-Chun Chang, Cheng-Lin Cho, Yi-Chen Lin, C.-C. Huang, C.-C. Mo, Wen-Hung Chung, Hsien-Chin Chiu, "Fabrication of inkjet-printed carbon nanotube for enhanced mechanical and strain-sensing performance," *Electronic and Photonic Devices and Systems section of the ECS Journal of Solid State Science and Technology*, vol. 10, 2021, pp.121001.
9. Hsuan-Ling Kao\*, "On-Chip Voltage-Controlled Oscillator Based on a Center-Tapped Switched Inductor Using GaN-on-SiC HEMT Technology," *Electronics*, vol. 10, no. 23, 2021, pp. 2928.
10. Lee, K. M., Chiu, W. H., Tsai, Y. H., Wang, C. S., Tao, Y. T., & Lin, Y. D. (2022). High-performance perovskite solar cells based on dopant-free hole-transporting material fabricated by a thermal-assisted blade-coating method with efficiency exceeding 21%. *Chemical Engineering Journal*, 427, 131609.
11. Lee, Kun-Mu, et al. "Star-shaped cyclopentadithiophene-based dopant-free hole-transporting material for high-performance perovskite solar cells." *Chemical Communications* (2021).
12. Cher Ming Tan, Vimal Kant Pandey, Yueh Chiang, and Tsung Ping Lee, "Electronic Reliability Analysis Under Radiation Environment", *Sensors and materials*, 2021